THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte BERND MORSBACH,
HELMUT DAUDEL, and UWE GAERTNER

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Appeal No. 96-0153
Application 08/014,407[1]

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ON BRIEF

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Before JOHN D. SMITH, GARRIS, and OWENS, Administrative Patent Judges.

GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

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[1] Application for patent filed February 5, 1993.

This is a decision on an appeal from the final rejection of claims 1 through 6 which are all of the claims remaining in the application.

The subject matter on appeal relates to a process for selective catalytic reduction of nitrogen oxides from exhaust gases using pulsed superstoichiometric addition of $NH_3$ or $NH_3$-releasing substances. Claims 1 and 5 are representative of this appealed subject matter and read as follows:

1. A process for selective catalytic reduction of nitrogen oxides from exhaust gases, using pulsed superstoichiometric addition of $NH_3$ or $NH_3$-releasing substances, which comprises controlling the pulsed superstoichiometric addition of $NH_3$ in such a way that, after it has started, the addition is interrupted again only when the amount of $NH_3$ stored in the catalyst has reached a specific upper threshold value which is predetermined in accordance with the catalyst properties and the catalyst volume, the amount of $NH_3$ stored being calculated from the difference between the metered amount of $NH_3$ and the amount of $NO_x$ separated off, which is determined from the $NO_x$ concentration in the exhaust gas and the average degree of separation, and the addition of $NH_3$ is resumed only when the amount of $NH_3$ stored in the catalyst, which is determined in the same way, has reached a predetermined lower threshold value, this pulsed addition of $NH_3$ being interrupted after a predetermined number of cycles until the amount of $NH_3$ stored in the catalyst, which is determined in the manner described, has completely reacted, this completing one entire cycle of the pulsed addition of $NH_3$.

5. The process of claim 1, wherein the $NO_x$ concentration downstream of the catalyst is measured and the interruption in $NH_3$ metering after the predetermined number of cycles does not

continue until the $NH_3$ stored in the catalyst has completely reacted but the addition of $NH_3$ is resumed when the $NO_x$ concentration downstream of the catalyst exceeds a predetermined threshold value.

The following prior art is relied upon by the examiner as evidence of obviousness:

Brand et al. 4,963,332 Oct. 16, 1990

The admitted prior art described on pages 1 through 3 of the appellants' specification.

All of the claims on appeal stand rejected as follows:

(1) under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which the appellants regard as their invention;

(2) under 35 U.S.C. § 112, first paragraph, as being based upon a specification disclosure which would not enable one with ordinary skill in the art to make and use the here claimed invention; and

(3) under 35 U.S.C. § 103 as being unpatentable over the admitted prior art in view of Brand.

We refer to the brief and reply brief and to the answer for a complete exposition of the opposing viewpoints expressed by the appellants and the examiner concerning the above noted rejections.

## OPINION

For the reasons which follow, we cannot sustain any of the rejections advanced by the examiner on this appeal. However, pursuant to our authority under 37 CFR § 1.196(b), we will make a new rejection of claims 5 and 6 under the fourth paragraph of 35 U.S.C. § 112.

The section 112, second paragraph, rejection

On page 4 of the answer, the examiner expresses his position concerning this rejection in the following manner:

> The word "predetermined" is indefinite, in that it does not specifically and distinctly claim a value that is considered to be the invention. If one were to select a "predetermined" value equal to "0" which would meet the limitations of the claims, then there would be no ammonia loading and therefore the claims would be unclear. The use of the word "predetermined" is taken to mean merely the preselecting of a value.

It is well settled that the definiteness of claim language must be analyzed, not under a vacuum but, always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art.

In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). When so interpreted, it is apparent that the claim term "predetermined" does not "mean merely the preselecting of a value" such as "0" as the examiner urges. Indeed, the examiner's contention that the selection of "a 'predetermined' value equal to '0' . . . would meet the limitations of the claims . . . [whereby] there would be no ammonia loading" is entirely inconsistent with the appellants' application disclosure.

Under these circumstances, we cannot sustain the examiner's section 112, second paragraph, rejection of claims 1 through 6.

The section 112, first paragraph, rejection

The examiner's nonenablement position, as expressed on page 3 of the answer, is set forth below:

> In the present disclosure, on page 3, lines 17-19, it is stated that the threshold value is determined in accordance with the catalyst properties and catalyst volume. What properties of the catalyst are used to make this determination and how exactly are they correlated to the values? Due to the unpredictable nature of catalytical processes, it is submitted that one of ordinary skill in the art would not know which specific properties could be used to determine the present operating parameters without undue experimentation.

The portion of the specification disclosure above referred to by the examiner relates to the upper threshold value of the amount of $NH_3$ stored in the catalyst. The appellants' disclosed correlation between this upper threshold amount and catalyst properties is logical and rational since the amount of $NH_3$ that can be stored in a catalyst clearly depends upon such properties as the $NH_3$ adsorption capability of the particular catalyst in question. This would have been appreciated by one with ordinary skill in the art as evinced, for example, by the teaching on lines 34 through 38 in column 1 of Brand.

We appreciate that experimentation may be required in order to determine the $NH_3$ amount that can be stored or adsorbed by a particular catalyst; the appellants expressly disclose as much (e.g., see lines 12 and 13 on specification page 4). Nevertheless, the mere fact that experimentation, even a considerable amount of experimentation, is involved does not necessarily support a conclusion that the required degree of experimentation is "undue". See In re Angstadt, 537 F.2d 498, 504, 190 USPQ 214, 219 (CCPA 1976) and Ex parte Forman, 230 USPQ 546, 547 (Bd. Pat. App. & Int. 1986). On

this record, the experimentation required to determine the upper amount of $NH_3$ storable in a particular catalyst appears to be straightforward, and the examiner has failed to present persuasive argument or evidence in support of his position that the amount of experimentation would be "undue".

In light of the foregoing, we also cannot sustain the examiner's section 112, first paragraph, rejection of claims 1 through 6.

The section 103 rejection

We agree with the appellants that Brand teaches away from the examiner's proposed combination thereof with the admitted prior art. Specifically, Brand teaches using a measuring and regulatory control for adding ammonia to exhaust gas in such a manner as to avoid ammonia adsorption by the catalyst and the undesirable effects associated therewith (see lines 34 through 45 in column 1 and lines 17 through 19 in column 4 of the reference) which is antithetical to the admitted prior art technique wherein the catalyst is deliberately adsorbed or loaded with $NH_3$. We also agree with the appellants' basic position that neither the admitted prior art nor Brand contains any teaching or suggestion of the here claimed

features involving "predetermined" values. The examiner's opposing view is premised upon his previously discussed unacceptable position that "these values encompass any value . . . [including] the value of 0" (answer, page 6).

Under these circumstances, the section 103 rejection of claims 1 through 6 as being unpatentable over the admitted prior art in view of Brand likewise cannot be sustained.

The new rejection pursuant to § 1.196(b)

The last 6 lines of independent claim 1 define a limitation wherein the pulsed addition of $NH_3$ is interrupted after a predetermined number of cycles until the amount of $NH_3$ stored in the catalyst has completely reacted. This independent claim limitation is described on lines 5 through 24 on specification page 5 and is referred to as a "discharge phase" which compensates for differences between calculated and actual loading of the catalyst with $NH_3$. In contrast, claim 5, which depends from claim 1, defines a limitation wherein the claim 1 interruption in $NH_3$ "does not continue until the $NH_3$ stored in the catalyst has completely reacted" but instead "the addition of $NH_3$ is resumed when the $NO_x$ concentration downstream of the catalyst exceeds a

predetermined threshold value". This claim 5 limitation is described in the paragraph bridging specification pages 5 and 6 as an improved technique for effecting the earlier mentioned compensation while avoiding disadvantages associated with completely reacting the stored $NH_3$. It is apparent that the limitations of independent claim 1 and dependent claim 5 are incompatible. Indeed, the independent claim requirement that stored $NH_3$ be "completely reacted" is expressly repudiated by the

dependent claim 5 recitation that the claim 1 interruption step "does not continue until the $NH_3$ stored in the catalyst has completely reacted".

According to the fourth paragraph of 35 U.S.C. § 112, a dependent claim "shall . . . specify a further limitation of the subject matter claimed . . . [and] shall be construed to incorporate by reference all the limitations of the claim to which it refers". As explained above, dependent claim 5 does not further limit or incorporate by reference all the limitations of parent claim 1. On the contrary, this dependent claim expressly repudiates a limitation of its parent claim. For these reasons, we hereby invoke our

authority under 37 CFR § 1.196(b) and reject claim 5 as well as claim 6 which depends therefrom (and therefore exhibits the same infirmity) for failing to comply with the fourth paragraph of 35 U.S.C. § 112.

Summary

The decision of the examiner is reversed.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b)(amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR
§ 1.196(b) provides that, "A new rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of
the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

> (1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter

> reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .
>
> (2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED; 1.196(b)

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|---|---|---|
| John D. Smith<br>Administrative Patent Judge | ) | |
| Bradley R. Garris<br>Administrative Patent Judge | ) | BOARD OF PATENT APPEALS AND INTERFERENCES |
| Terry J. Owens<br>Administrative Patent Judge | ) | |

tdc

Appeal No. 96-0153
Application No. 08/014,407

Keil & Weinkauf
1101 Connecticut Avenue, N.W.
Washington, DC 20036